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10/817,092

03/31/2004

Paul A. Knight

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EXAMINER

DUONG, THO V

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

05/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/817,092 | Applicant(s) KNIGHT ET AL. | |
| | Examiner Tho v. Duong | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of “said plurality of thermal management blocks provide spray cooling”; “said plurality of thermal management blocks are spray cooling thermal management blocks are spray cooling thermal management blocks”, “said spray cooling thermal management blocks include at least one atomizer”; “said cold fluid channel is connected to a secondary cooling system” and “said secondary cooling system is a refrigeration system” must be shown or the feature(s) canceled from the claims 4-5, 9 and 17-18. No new matter should be entered.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "72" and "74" have both been used to designate “return branches” on page 11 and page 13. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “39” has been used to designate both “quick disconnect fitting” and “return

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fins" in paragraphs 37 and 40. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference number (38,39) cited on paragraphs 37 and 40 are not shown in the drawing. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the claimed subject matter of “said plurality of thermal management blocks provide spray cooling”; “said plurality of thermal management blocks are spray cooling thermal management blocks are spray cooling thermal management blocks” and “said spray cooling thermal management blocks include at least one atomizer” are not supported by the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "said secondary cooling system" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2,4,6-7,10,12,14-15 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Richard C. Chu (US 3,586,101). Chu discloses (figure 1) a liquid cooling system comprising a plurality of thermal management blocks (12) in thermal connection with electronic components; the thermal blocks (12) fluid connected to a plurality of return channels (30) for transferring the two phase fluid to a heat exchanging return manifold (32,44,66 and 68); the heat exchanging return manifold contains a cold fluid channel (60,68) dissipating heat from the working fluid; a reservoir (40) fluidly connected to a pump (42); and the cold fluid channel is connected to a secondary cooling system (62,74).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,5 and 11,13 rejected under 35 U.S.C. 103(a) as being unpatentable over Richard Chu in view of Marsala (US 6,519,955). Richard substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the condenser connected to a water system or includes a refrigeration system. Marsala discloses (figure 1 and column 3, lines 61-67) many suitable forms of heat rejection (condenser) that connects to the system wherein the condenser can be connected to a water source (water condenser) or an evaporative condenser (refrigeration system) so that more heat can be effectively removed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use many type of heat rejection that is available or taught by Marsala for a purpose of effectively removing heat from the condenser.

Claims 9 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richard Chu in view of Cole et al. (US 6,498,725). Richard discloses substantially all of applicant's claimed invention as discussed above except for the limitation that the thermal management blocks provide atomizer sprays. Cole discloses (figure 1) a thermal management block comprises of atomizer for a purpose of spraying coolant on the electrical device so that heat transfer efficiency of the system is increased. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Cole's teaching in Richard's

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device for a purpose of spraying coolant on the electrical device so that heat transfer efficiency of the system is increased.

Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richard Chu in view of Lomolino Sr. et al. (US 5,427,174). Richard substantially discloses all of applicant's claimed invention as discussed above except for the limitation that the liquid coolant is a multi-component mixture. Lomolino discloses (figure 1 and column 7, lines 13-36) a liquid cooling system that has the coolant to be a multi-component mixture for a purpose of effective cooling when the electrical component requires two or more operational temperatures. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use Lomolino's teaching in Richard's device for a purpose of effective cooling when the electrical component requires two or more operational temperatures.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ashiwake et al. (US 5,406,807) discloses an apparatus for cooling semiconductor device.

Antonetti et al. (US 3,774,677) discloses a cooling system.

R. C. Chu et al. (US 3,609,991) discloses a cooling system having thermally induced circulation.

Chu et al. (US 5,953,930) discloses an evaporator for use in an extended air cooling system.

Nicolai et al. (US 7,057,893) discloses a cooling array.

Weber (US 7,000,691) discloses a method and apparatus for cooling with coolant at a sub ambient pressure.

Richard et al. (US 3,512,582) discloses an immersion cooling system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tho v. Duong whose telephone number is 571-272-4793. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tyler J. Cheryl can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tho v Duong/
Primary Examiner, Art Unit 3744

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